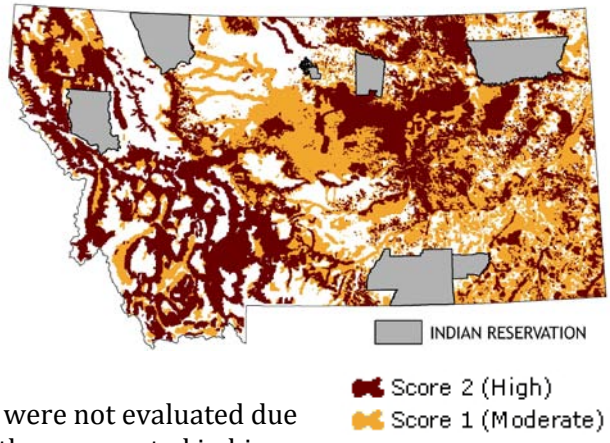
NATIVE GAME SPECIES

Big Game Winter Range Habitat



SUMMARY: This layer depicts the relative value of habitats providing big game winter range for elk, white-tailed deer, mule deer, antelope and moose.

MEASUREMENT UNIT: Public land survey sections - approximately one square mile.

MAPPING CONSIDERATIONS: Indian reservations were not evaluated due to a lack of data. National park lands are not currently represented in big game distribution layers and therefore have lower than expected values in some areas.

DATA SOURCE(S) / QUALITY:
Big Game: *Metric Evaluated*: Winter range habitat value. *Species*: pronghorn antelope, elk, moose, mule deer and white-tailed deer. *Data Layers*: big game distribution - publicly available for individual species, maintained by FWP. Layers are updated using expert knowledge, which includes known habitat associations and extrapolation from survey data. Resolution is based upon 1 square mile public land survey sections; Montana land cover classification – draft layer maintained by the Montana Natural Heritage Program (NHP) Spatial Analysis Lab, University of Montana. Classification based upon remote sensing. Resolution is 30 meters

METHODS: Big game habitat values were determined by assigning points based on species use and habitat quality. All winter habitat was assigned an initial score of 1 and an additional point was assigned for more highly valued areas. Following is a description areas that were assigned higher values. In the western mountains, areas identified as winter use in the species distribution layers received one point. In the Northwest (FWP Region 1) winter use of elk or white-tail deer was given an additional point. In the Southwest (FWP Regions 2 & 3), elk or mule deer was given an additional point. For the rest of the state, areas identified as winter use areas for one species received a point and an additional point if the area was winter range for additional species. Also, sagebrush grassland habitats were used to identify important habitats in the prairie environment where winter ranges are less distinct. Areas containing >50% sagebrush grassland, received one point and areas containing >75% sagebrush grassland were given an additional point. The final summed value was rescaled to 0 to 1 before being combined with the other species categories.

DATA SOURCES

- ○ Survey data – counts or estimates
- ○ Survey data – categorical (e.g. presence/absence)
- ✓ Expert opinion based on observation

DATA EXTRAPOLATION TECHNIQUE USED

- ○ None
- ○ Modeling of habitat-species associations (deductive)
- ○ Statistical modeling (inductive)
- ○ Extrapolation to habitat unit (e.g. stream section)
- ✓ Extrapolation based on expert opinion

FINAL CATEGORIZATION: The resulting scores ranged from 0 to 2. A score of 0 indicates the area was not identified as having winter range present. A score of 1 indicates important winter range habitats. A score of 2 indicates highly valued winter range habitats. Big game winter range was given twice the value of the other species groups for the calculation of the cumulative native game layer.

CATEGORY	PERCENT OF STATE
SCORE 2 (High)	35.6 %
SCORE 1 (Moderate)	30.0 %

CONTACT: Adam Messer, FWP – Data Services Section; 406.444.0095; amesser@mt.gov

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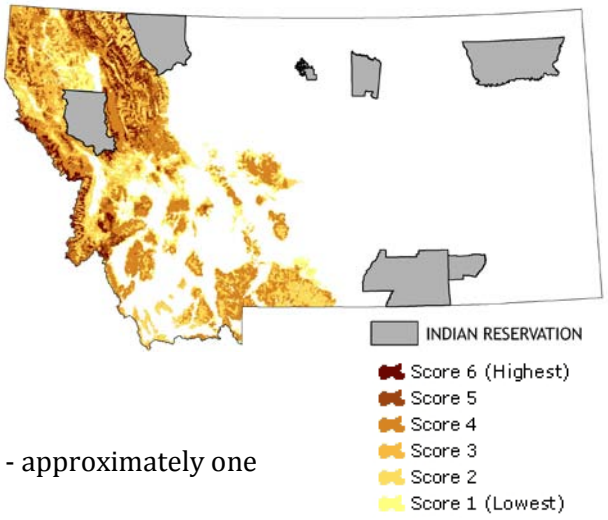
NATIVE GAME SPECIES

Forest Carnivore Habitat



SUMMARY: This layer depicts the relative value of areas based upon the specific habitat requirements of 3 forest carnivores; marten, fisher and wolverine. Values are cumulative, but it is important to realize that an area with a lower cumulative value can still contain high value habitat for just one species.

MEASUREMENT UNIT: Public land survey sections - approximately one square mile.

MAPPING CONSIDERATIONS: Indian reservations were not evaluated due to lack of data.

DATA SOURCE(S) / QUALITY:
Forest Carnivores: *Metric evaluated*: habitat suitability. *Species*: wolverine, fisher, marten. *Data layers*: furbearer harvest locations – maintained in FWP mandatory reporting system. Reporting at the section level by trappers; Furbearer observation records – maintained in NHP Point Observation Database. Accuracy verified by NHP staff; Wolverine primary habitat model – produced by the Wildlife Conservation Society. Resolution is 90 meters; Fisher and marten habitat suitability model developed using known locations and reviewed by FWP biologists. Resolution is 90 meters.

DATA SOURCES
- ○ Survey data – counts or estimates
- ✓ Survey data – categorical (e.g. presence/absence)
- ○ Expert opinion based on observation

DATA EXTRAPOLATION TECHNIQUE USED
- ○ None
- ✓ Modeling of habitat-species associations (deductive)
- ✓ Statistical modeling (inductive)
- ○ Extrapolation to habitat unit (e.g. stream section)
- ○ Extrapolation based on expert opinion

METHODS: Forest carnivore habitat values were determined by using habitat suitability models. The wolverine model was produced by the Wildlife Conservation Society. Sections with greater than 50% of the area identified as suitable habitat for wolverine were assigned 2 points. Fisher and marten models were produced by FWP. Model output was classified into 3 categories highly suitable, moderately suitable and not suitable. If greater than 50% of the section were in the moderate to highly suitable category 1 point was assigned. If greater than 50% of the section was in the highly suitable category 2 points were assigned. Values were then combined across all 3 species. In areas of species overlap, values were cumulative to a maximum value of 6 points. Values were only calculated in western forest habitats where forest carnivores were expected. The contribution to the overall possible terrestrial game score for each section was only considered in these forest areas. Thus in eastern prairies, the total possible score for a section only included prairie grouse, big game winter habitat, and bighorn sheep/mountain goat. The final summed value was rescaled to 0 to 1 before being combined with the other species categories.

Montana Fish, Wildlife & Parks

Crucial Areas Assessment

FINAL CATEGORIZATION: The resulting scores ranged from 0 to 6. Percentage of land area in each class is shown in the table.

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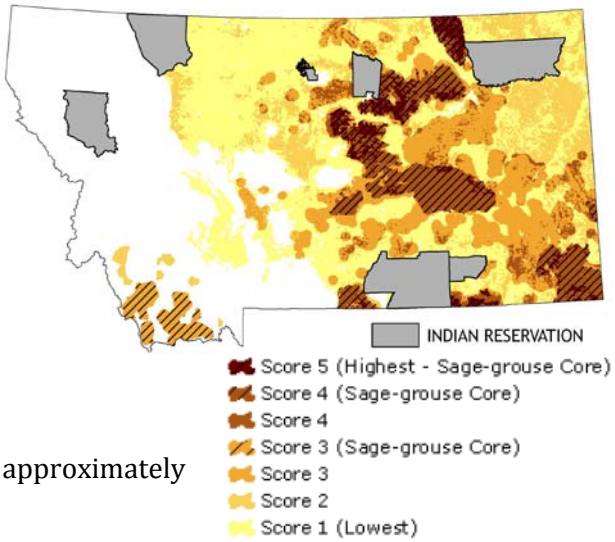
CATEGORY	PERCENT OF STATE
SCORE 6 (Highest)	1.1 %
SCORE 5	1.9 %
SCORE 4	7.8 %
SCORE 3	3.9 %
SCORE 2	6.3 %
SCORE 1 (Lowest)	2.4 %

NATIVE GAME SPECIES

Prairie Grouse Habitat



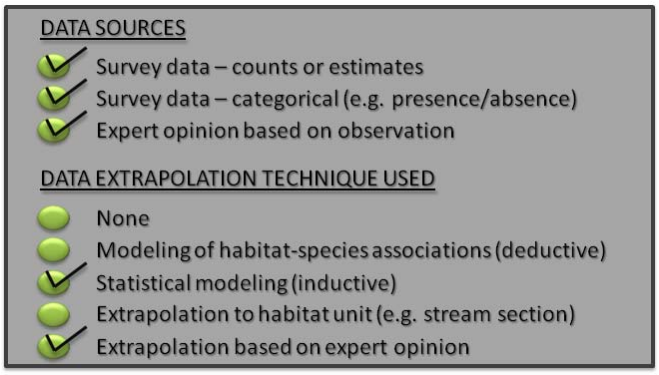
SUMMARY: This layer depicts the relative value of areas based upon the specific habitat requirements Sharp-tailed grouse and sage-grouse. Values are cumulative, but it is important to realize that an area with a lower cumulative value can still contain high value habitat for just one species.

MEASUREMENT UNIT: Public land survey sections - approximately one square mile.

MAPPING CONSIDERATIONS: Indian reservations and national parks not evaluated due to lack of data.

DATA SOURCE(S) / QUALITY:

Prairie Grouse: *Metric Evaluated*: Core habitat areas, lek areas, and habitat suitability. *Species*: sage-grouse, sharp-tail Grouse. *Data layers*: sage-grouse and sharp-tail grouse lek locations and observations collected via ground and aerial surveys by FWP and Bureau of Land Management biologists – maintained in FWP sage-grouse database; Sage-grouse core areas – developed and maintained by FWP with input from Bureau of Land Management. Publicly available layer based expert knowledge review of sage-grouse habitat suitability model using lek locations and limited to areas of highest male density. Sharp-tail grouse habitat suitability model developed using lek locations and reviewed by FWP biologists. Resolution is 90 meters.



METHODS: Prairie grouse habitat was assigned 3 points to sage-grouse core areas and outside of core areas, 2 points were assigned to sage-grouse lek areas. Two points were assigned to highly suitable sharp-tail grouse habitat and 1 point to moderately suitable sharp-tail grouse habitat. In areas with species overlap, values were cumulative to a maximum value of 5 points. Values were only calculated in prairie areas where prairie grouse were expected. The contribution to the overall possible terrestrial game score for each section was only considered in these prairie areas. Thus in western forests, the total possible score for a section only included forest carnivores, big game winter habitat, and bighorn sheep/mountain goat. The final summed value was rescaled to 0 to 1 before being combined with the other species categories.

Montana Fish, Wildlife & Parks
Crucial Areas Assessment

FINAL CATEGORIZATION: The resulting scores ranged from 0 to 5. Percentage of land area in each class is shown in the table.

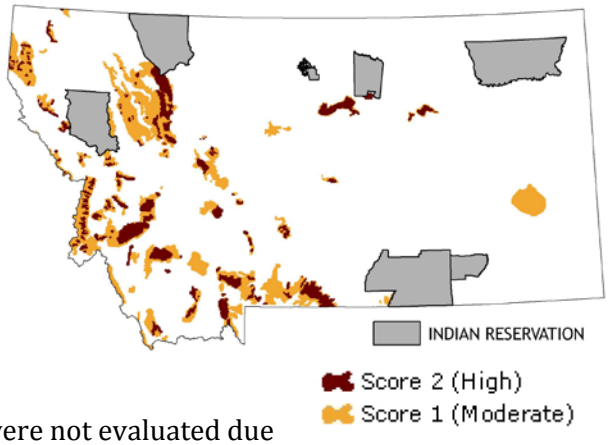
CONTACT: Adam Messer, FWP – Data Services Section; 406.444.0095 ; amesser@mt.gov

DATE MODIFIED: April 7, 2010 – V 1.0

CATEGORY	PERCENT OF STATE
SCORE 5 (Highest)	2.6 %
SCORE 4	9.3 %
SCORE 3	14.3 %
SCORE 2	11.5 %
SCORE 1(Lowest)	29.7 %

NATIVE GAME SPECIES

Bighorn Sheep and Mountain Goat Habitat



SUMMARY: This layer depicts the relative value of areas based upon the specific habitat requirements of bighorn sheep and mountain goat.

MEASUREMENT UNIT: Public land survey sections - approximately one square mile.

MAPPING CONSIDERATIONS: Indian reservations were not evaluated due to a lack of data. national park lands are not currently represented in big game distribution layers and therefore have lower than expected values in some areas.

DATA SOURCE(S) / QUALITY:

DATA SOURCES

- Survey data – counts or estimates
- Survey data – categorical (e.g. presence/absence)
- ✓ Expert opinion based on observation

DATA EXTRAPOLATION TECHNIQUE USED

- None
- Modeling of habitat-species associations (deductive)
- Statistical modeling (inductive)
- Extrapolation to habitat unit (e.g. stream section)
- ✓ Extrapolation based on expert opinion

Bighorn sheep and mountain goat: *metric evaluated*: general and winter distribution. *Data layer*: big game distribution - publicly available for individual species, maintained by FWP. Layers are updated using expert knowledge, which includes known habitat associations and extrapolation from survey data. Resolution is based upon 1 square mile public land survey sections.

METHODS: **Bighorn sheep and mountain goat** received 1 point for overall distribution and 2 points for winter use. In areas of species overlap, values were not cumulative, the highest value was chosen. The final summed value was rescaled to 0 to 1 before being combined with the other species categories.

FINAL CATEGORIZATION: The resulting scores ranged from 0 to 1. The mean (0.37) and the standard deviation (0.23 SD) of the final scores were calculated. Final categories were determined by assessing the deviation from the mean value. The highest category had values > 1.5 SD from the mean. The high category was 0.5 to 1.5 SD from the mean value. The moderate category ranged from -0.5 SD below the mean to 0.5 SD above the mean. The low category was < -0.5 SD from the mean. Actual values and percentage of land area are shown in the table.

CATEGORY	PERCENT OF STATE
SCORE 2 (High)	3.1 %
SCORE 1 (Moderate)	6.8 %

CONTACT: Adam Messer, FWP – Data Services Section; 406.444.0095; amesser@mt.gov

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